Space Weather Forecast

Issued on Saturday, 22 October 2022 at 01:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor to G2/Moderate Storm, mainly Day 2 (23rd)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has been Low, with only a few small common class flares observed. There are currently three sunspot regions on the visible Sun, however these are all currently small and simple regions. The most likely source of any flares is the only developmental region, a small bipolar spot in the southwest quadrant The potential CME mention in the previous forecast was not observed as occurring, with no other Earth-directed CMEs observed.

Solar Wind / Geomagnetic Activity: The solar wind was mostly at background with speeds, falling from initially slightly elevated levels of 420km/s to around 350-400km/s for much of the period. The strength of the magnetic field rose erratically from being weak to peak at moderate values. The north-south component remained weak throughout however, and mostly positive (northward) from 21/1045 UTC. Geomagnetic activity was Quiet with isolated Unsettled intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is most likely to continue Low, perhaps falling to Very Low, but with a daily slight chance of an isolated Moderate class flare.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Solar winds are expected to see a gradual transition into the fast wind of a coronal hole on day 1 and into day 2 (22nd and 23rd), with solar winds becoming Elevated. This is low confidence in both timing and strength. The fast winds will likely persist day 3 (24th), before potentially easing day 4 (25th). Geomagnetic activity is expected to rise from Quiet day 1 (22nd) to be Unsettled to Active with an increasing chance of G1/Minor to G2/Moderate storms either later day 1 or more likely day 2 (23rd). Quiet to Unsettled with isolated Active intervals then expected day 3 and day 4 (24th and 25th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	60	10	1
Strong	G3	No	1	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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